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ABSTRACT

This paper briefly examines the past and present status of school health services and describes a study designed to compare the health assessment abilities of the physical examination with a health history questionnaire technique. The study demonstrates the superiority of the health history as a diagnostic procedure and as a means of increasing parental involvement. These findings suggest that the school health services using the health history procedures would be able to make referrals to community health agencies which are based on adequate information, and that such a specific referral, accompanied by clinical data and parental involvement, could help overcome the poor clinical image of school health services today. It is suggested that the periodic physical examination (without use of medical histories of children) is an inadequate procedure for the appraisal of the health status of children. (GO)

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THE ROLE OF THE HEALTH HISTORY IN RE-ESTABLISHING THE VALUE OF SCHOOL HEALTH SERVICES

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School health services have been features of American primary and secondary education for over half a century. There is much discussion of their value and use at the present time, and this is appropriate, but it should not be overlooked that the long existence of school health services is due not to mindless tradition but to the demonstrated value of school health activities in the past.

This paper is a limited attempt to enquire into the nature of past worth, the reasons for the currently felt fall from grace, and suggestions from field experiments on means by which school health may once more serve the health and educational needs of school students.

Value, or worth, of services can be more precisely expressed in terms of the effectiveness with which certain objectives are, or were, met. Despite differences in emphases and language it appears that school health services today, and a half-century ago, subscribe to the same objectives, which are based on an understanding of health best described as a "a state of complete physical, mental and social well-being"[1]:

- to protect students from the health hazards of their work place
- to ensure that students are in a state of optimal health in order to obtain full benefit from their education

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- to educate students for survival and healthy living both during school years and throughout adult life
- to assist the community improve its health status by using, as appropriate, the "captive" nature of the school-student population

Physicians entered schools as a result of the community's concern to eradicate preventable communicable diseases; a concern which had been tutored by the great public health movement of the mid to late nineteenth century. Inspection of the sanitation and hygiene of school buildings was followed by the additional duty of classroom inspections of students to detect and exclude those with infectious diseases which could be communicated to others.[2] At such group inspections physicians also noted the grave physical deformities and handicaps of children brought into school by the passage of compulsory education laws. Thus the examination of the individual child for physical defects was born; however, it took time to be fully accepted and refined. Newmayer, at one time Supervisor of School Medical Inspection in Philadelphia wrote in 1924: "Physical examinations, or what are termed in some cities, "individual examinations," are conducted for the purpose of detecting any variations from the normal that may interfere with the health, growth and development of the child. Some cities have laws or rules which forbid the physician touching the child during an examination".[3] It was the exposure of the general population to medical services during World War II which finally allowed the school examination to develop into a medically acceptable, unclothed physical examination.[4]

The value of school medical activities appears to have been accepted for two reasons: prevention of epidemics;[5] and the detection

of physical defects in need of attention. Of the latter it was written in 1916, "The conditions revealed as a result of these (clothed) physical examinations were of sufficient importance to attract the attention of the health authorities to the necessity of more complete control of the health of the child during its school life."[6] In addition the relationship between health and education was confidently asserted: "Backwardness in school, according to prevailing opinions, is due as much to physical defects as to mental deficiency. In other words, such children become laggards. 'Sixteen per cent of all who drop out of school do so because of ill health,' saw Dr. Luther H. Gulick; 'and those who have physical defects, such as poor hearing, poor seeing, hypertrophied tonsils and adenoids or decayed teeth, progress through school 9 per cent more slowly than children who are not so handicapped.'[7] Any doubts about general community acceptance were dispelled by Newmayer who noted in 1923 that after twenty-five years "the value of school medical inspection of schools needs no greater endorsement than the fact that many of the State legislatures have passed laws authorizing the value of a system of inspection, and in numerous States medical inspections are mandatory."[3]

School physicians met some of the objectives of early school health services by reducing the health hazards of the buildings, assessing the health status of individual students and so doing improving the health of the community. The introduction of school nurses saw not only an expansion of school health services but a change in their character as impact was made on all objectives.

The story is exciting whenever told: Lina L. Rogers, a trained nurse loaned by Lillian Wald from the Henry Street Settlement, more

than halved absenteeism in some New York schools within a matter of weeks.[8] This dramatic result led to the funding of 12 nurses in that same year, 1902;[8] a number which grew to 179 only 10 years later.[3]

The nurses added referral, follow-up, parent and patient education to the existing services of the physician. The physician's medical inspections had resulted in exclusion of children from school because of contagious diseases. Uneducated, working and immigrant parents of the turn of the century often did not understand the reason for exclusion, the treatment of simple contagious diseases, nor the value or location of medical care. In obtaining medical care there were problems of finance, language, superstition, illiteracy, baby-sitting added to the general problems of poverty, overcrowding, unhygienic housing, malnutrition. The nurses' home visits and other contacts with the family and student, and the practical education which resulted, led to treatment of disease and the rapid return of the child to school.

Further reduction in absenteeism resulted as the nurse took over the physician's task of classroom medical inspection for contagious diseases and instituted treatment for minor cases in the school's health room.

The physician was freed "to devote his entire time to making physical examinations of the children."[3] This activity generated many cases of physically defective children, however, treatment was obtained for only 6 per cent until the school nurses added to non-contagious diseases their already proven follow-up skills thus leading to treatment of 50 per cent of the cases recommended for treatment, ranging from 95 per cent of "non contagious skin diseases" treated to 24 percent of "hypertrophied tonsils and adenoids" treated.[3]

Early in their history the school nurses provided health education

for students beyond the extensive personal and family instruction and counseling regarding the students' illness and its care. Little Mothers' Clubs taught students the care of their younger siblings including the bathing, feeding, dressing and play of babies in practical classes, at school. Current survival, preventive health and future healthy living have rarly been served so well!

Times, and the health problems of school students, have changed. The communicable diseases, so justifiably dreaded in the early Twentieth Century have been, except for V.D., diminished, due to immunizations, antibiotics and general community sanitation, to virtually a nuisance level. Medicine, surgery, preventive medicine, and crippled children's program funding have had great impact upon gross handicaps and defects. Vision and hearing deficiencies are detected early by school screening tests.

As the pall of communicable diseases has lifted other health problems of the school-age population have come into clearer focus: preventable deaths due to accidents, suicide, homicide; child abuse; malnutrition; venereal disease; pregnancy; emotional and behavioral problems; learning disability; alcohol and drug abuse; mental retardation; iron-deficiency anemia; lead poisoning and its sequelae; untreated dental caries; incomplete immunizations; special health problems of certain groups, eg. migrant children.[9]

On the other hand services and programs have tended to remain the same, frequently honored by tradition and regulation, but having lost "effectiveness or relevance" in regard to health improvement.[10] "The principal activities of many school physicians and nurses in the United States today are concerned with the control of communicable disease through inspection of pupils returning from absence (largely ineffective),

detection of health problems by periodic physical examination and screening tests, and first-aid care for minor morbidity."[10]

The value or effectiveness of current school health services in meeting the objective stated above can be briefly reviewed:

- the old concern with the sanitation and hygiene of the school-work place has not been replaced with an interest in the school environment as a place of accidents; pollution; social and emotional stress; separation crises; competition; nutrition; work performance and ergonomics; shop and other occupational type hazards.
- health education has been developed as an aspect of curriculum instruction and thus is rarely related to the students' experiences of health, illness, medical care. Frequently health education is geared to knowledge for its own sake, or for some time in the future, and NOT for the student's day to day survival in school where motor vehicles, drugs, alcohol, V.D., pregnancy, violence, failure, growth and change are daily problems.
- school health, as an adjunct of community health, has been rarely used. Rubella immunization may be the classic example of an activity of greater benefit to the community as a whole than the school students who receive it. On the other hand school health services have not prevailed upon community resources to help meet their needs eg. for reparative dental work.
- finally, the optimal health of individual students, the main topic of the rest of this article, depends, first, upon health

assessment to discover problems and second, on a follow-up mechanism to ensure that problems receive appropriate care for either resolution or maximum function.

The periodic physical examination is the cornerstone of current health assessment. Aside from the fact, that it is usually performed as a cursory inspection[10,11] the physical examination is a limited method: it has a low yield of important health problems discovered for the first time, in other words it is not of great value in detecting major disease not already clearly evident[12,13] and thus known to the parent and/or the student.

The types of "defects" discovered by physical examination are best illustrated in Table I.

TABLE I

REMEDIAL DEFECTS FOUND AMONG 62,332 PUPILS[14]

DEFECT	PERCENT
Impacted cerumen	4.6 %
Orthopedic (poor posture, flat foot, scoliosis, etc.)	4.4
Diseased tonsils	3.3
Non-contagious skin diseases	1.9
Phimosis	1.5
Umbilical hernia	1.4
Organic heart disease	.8
Defective speech	.7
Undescended testes	.5
Otitis media	.2
Hyperactivity	.1
Asthma	.1
Inguinal hernia	.1
Ringworm of foot	.1
Ringworm of scalp	0.05
Enuresis	0.05
Other	2.2

It is questionable whether most of these "defects" should be so classified. "A great disservice is done by failing to distinguish from among physical findings those with true health significance, especially those which are correctable."[10]

Probably the greatest deficiency in the sole use of the physical examination for health appraisal is its severe limitation in assessment of development. "Appraisal of the health status of children requires an understanding of change as a basic attribute of growth and development. In this respect, it differs from the appraisal of the adult organism. The child is growing and undergoing rapid changes in physique, physiological processes, and personality structure. Growth alters characteristics and needs, and offers unique opportunities as well as hazards."[15]

In addition, the child's development takes place in school which presents a variety of hurdles and the hazards of failure. Rogers[10] has written of the early elementary school-age period: "The chief developmental goals at this time are concerned with acquiring increased independence from family, adaptation to society and mastery of written language. Children have varying degrees of difficulty in achieving these goals, but almost all experience trouble at some time. These difficulties are expressed as various disturbances of behavior, eg. anxiety, learning problems, disciplinary problems. In most instances these behaviors are self-limited and respond to temporary withdrawal of stress or to administration of encouragement and emotional support. In some instances there is danger that secondary emotional problems may be created by reactions of others - parents, teachers or peers - to the child's disturbed behavior. In this event the secondary problem may become more important and persist after the original one has ceased."

In view of the type of information required to assess the student's health and development, and the inadequacy of the physical examination in this regard, it is astonishing that the health history has been so little used in school health services. It is agreed that the health history has

been neglected and it is agreed that it is "one of the most important parts of the routine periodic health appraisal."[10,16] It has also been noted that it forms the basis for the physical examination[11,17] a statement so consistent with the practice of clinical medicine that it has shock value to see such a truism written.

Yet a comprehensive health history has not been incorporated into the routine health appraisal in any known school health program, it is not metioned in instructions to school physicians in some settings,[18] it received one page of description compared with 11½ pages devoted to the physical examination in an authoritative handbook for school physicians,[16] and it has been unrealistically reckoned to take about 15 minutes together with a physical examination, urinalysis, tuberculin test, health education conference, planning for follow-up![17]

Henderson[19] reported on an English experiment in which a health questionnaire was completed by the parent and returned to the school prior to the entering child's physical examination and in lieu of a physical examination for the older child. The questionnaire was designed to reveal problems which the examination would miss eg. emotional difficulties and epilepsy. The parents preferred the system, physicians experienced greater job satisfaction, and significant defects were not missed and many more problems, particularly emotional difficulties were found.

In the search for a more effective program the department of school health services in a large metropolitan school district decided to implement an experimental program to compare the health assessment abilities of the physical examination and a health history.

METHODS

Thirty-two elementary schools, public and parochial, across the city were selected by nursing supervisors. The number of schools in each of the 8 sub-districts ranged from 2 to 5. The selection was made in order to obtain a representative sample of schools and a cooperative staff. One or a number of kindergarten classes was chosen by the school nurse for the pilot health program. Incoming kindergarten children were assigned classes on a random basis.

A health history questionnaire was developed, using a variety of ambulatory pediatric resources. Parents of incoming kindergarten children were informed of the program, given the option of first taking the questionnaire home and given an appointment for an interview with the school nurse. At the interview the questionnaire was completed, if necessary, and all positive responses were explored by the nurse in detail. The nurse entered all problems on the problem list and drafted a plan of management for each problem in the progress notes. The health history and problem-oriented medical record were reviewed by the school physician to determine that all problems had been entered and that plans were appropriate. Follow-up with the aim of problem-resolution was the responsibility of the school nurse in consultation, as needed, with the school physician and in close relationship with the parent.

The headings under which information was collected in the health history were:

- Pregnancy and labor
- Infancy and early childhood development
- Past history (all illnesses, operations, hospitalizations and current medical and dental care.)
- Family health
- Review of systems (including a behavioral questionnaire)
- Immunization status
- Open-ended questions regarding functions and relationships with child.

Records of physical examinations performed on entering children in the kindergarten or first grades at each of the Pilot schools in the previous year were pulled and a random sample selected.

Physical exams were performed on students in the experimental group if indicated by the history. The results of these physical examinations were compared with the results of the previously taken history.

RESULTS

Physical Examination

The records ofphysical examinations performed in the year proceeding the experimental program on 466 students at 31 of the 32 pilot schools were examined. There were 259 males and 207 females. 296 were enrolled in kindergarten class, 160 in first grade and 10 in second grade at the time of the examination.

The physical examination form used had a short check list for parents regarding the child's past health, immunizations, severe family health problems, and three developmental milestones. The form was sent home for completion by the parent and signature of permission for the school physical examination.

Data was available on 362 records regarding completion of the health history check list by the parent and on 419 records regarding for parent's presence at the physical examination.

184, or 51%, of the available records showed at least one item checked on the health history check list; 177, or 32%, checked at least one of the three developmental milestone items. Parents were present at the physical examination in 139 instances, a rate of 33%.

Tables II and III summarize the number and type of "defects" or problems found on physical examination.

TABLE II

PHYSICAL EXAMINATION

NUMBER AND RATE OF DEFECTS DETECTED

Total number of students examined	466	
Number of normal students 60%		280
Number of students with defects 40%		186
Total number of problems/defects	242	
Defect or problem rate per student		
Total students		0.52
Students with problems/defects		1.30
Adjusted number of defects (removal of all defects/problems found, or potentially found by screening test, dental exam)	227	
Defect rate/total students		0.49

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TABLE III

PHYSICAL EXAMINATION

DEFECTS FOUND

(adjusted to exclude problems found by screening test)

Defect	Number of students with defect
Cerumen in ears	43
Tonsils	26
Flat foot	21
Speech	16
Heart	15 *
Posture	12
Hernia	12**
Skin	10
Strabismus	9
Nodes	8
Lungs	7
Phimosis	7
Abnormal Nervousness	6
Other Deformities	6
Nasal Obstruction	5
Blepharitis	3
Otitis Media	2
Undescended testes	2
Conjunctivitis	1
Miscellaneous	16
Total	227

* 7 were listed as "innocent" or "functional" murmurs

** 7 were listed as umbilical hernias

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Health History

The target population was 1,196 students; 106 or 8% were students in first grade, the rest in kindergarten.

16 parents, 1.3%, declined to participate in the pilot health program, often because their children were under pediatric care. 1,176 appointments with parents were made for a nurse-parent interview. 29 potential participants were "lost" in the transfers and moves and confusion of school opening (to which was added two long teachers' strikes). A total of 50 students were recorded as moving during the course of the year.

1,151 students were regarded as participants and of these 1,136 health histories were completed and 1,089 nurse-parent interviews were completed.

1,136 histories represent 97% of the 1,176 original appointments and 98.7% of the 1,151 "participants".

1,089 Nurse-parent interviews represent 93% of the 1,176 original appointments and 94.6% of the 1,151 "participants".

794 parents completed the health questionnaire prior to the nurse-parent interview. This represents 67.5% of the 1,176 initial appointments and would have been greater had some school nurses been more willing to give parents a choice in the matter.

70% of parents kept their first appointment. 139 telephone calls and 49 home visits were recorded as needed in order to complete the nurse-parent interview. In other words one telephone call was needed per eight histories completed, and one home visit per twenty-three completed histories.

Tables IV and V summarize the number and type of problems found on health history.

TABLE IV

HEALTH HISTORY

NUMBER AND RATE OF PROBLEMS FOUND

Total number of students examined		1136	
Number of normal students	6.6%		76
Number of students with problem(s)	93.4%		1075
Total number of problems		3629	
Problems rate per student:			
Total students			3.10
Students with problems			3.37
Adjusted number of problems (removal of all problems found or potentially found by screening test or dental exam, and problems of incomplete immunization and administrative and agency difficulties in follow-up)		2140	
Problem rate/total students			1.86

TABLE V

HEALTH HISTORY

PROBLEMS FOUND

(adjusted to exclude problems found by screening test)

Problem	Number of students with problem
Behavior	355
Development	282
Family environment	258
Respiratory	253
Gastro intestinal & nutrition	187
Family health	154
Musculo-skeletal	103
Hemopoietic	89
Allergy	87
Ears	80
Speech	78
Cardiac	45
Nervous system	41
Skin	37
Genito-urinary	34
T.B.	24
Accidents and injuries	20
Congenital	8
Endocrine	3
Acute infections	2
Total	2,140

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Physical Examination following Health History

Three (3) of the eight (8) sub-districts were randomly selected and every physical examination and its accompanying health history were studied in detail.

129 students were referred for a physical examination from a total of 443 health histories; 31% of females were referred and 27% of males. The physicians performing the examinations had been selected for participation in the pilot program and knew their work would be under scrutiny.

111 students were examined and 64 or 58% were found to have abnormalities. A total of 106 abnormalities were recorded (see Table VI).

Careful analysis revealed that some physical examinations were performed on the same day as the history and occasionally before the history. These were excluded as the findings on the physical examination would probably be incorporated in the history. Twelve (12) abnormalities were thus deleted. A further eighteen (18) abnormalities were so minor that they were removed (cerumen without impaction, ten (10); slight nasal discharge, one (1); enlarged tonsils with cold, one (1); innocent murmer, one (1); congested lungs with flu, three (3); slightly enlarged anterior cervical nodes, two (2).

74 significant abnormalities were recorded on the physical examination.

61, or 82%, were recorded on the prior history.

The thirteen (13) abnormalities recorded on the physical exam and not on the history were:

dental caries	4
cerumen	3
infection of eyelids	3
warts on hand	1
posture	1
speech	1

These are either minor abnormalities or ones which are discoverable by means other than a physician-conducted physical examination.

TABLE VI

PHYSICAL EXAMINATION FOLLOWING HISTORY 111 REFERRED STUDENTS

System examined	Number of students examined	Number of students with abnormal systems
General appearance	99	5
Behavior	98	3
Skin	76	4
Eyes	77	10
Ears	85	15
Tympanic membrane	67	2
Nose, mouth, pharynx	83	10
Teeth	74	27
Heart	73	3
Lungs	73	8
Abdomen	62	2
Genitalia	53	1
Bones, joints	67	1
Neurological	29	3
Other	20	12
TOTAL	1,036	106

DISCUSSION

In the experimental field program reported above the health history found 3.10 health problems per student. After elimination of problems of immunization and dental caries (55%), and actual or potential failed screening tests, the history revealed 1.86 problems per student, a rate 3.8 times greater than the defect rate in the control physical examination group (0.49).

The type of problems found were entirely different: with the educationally relevant problems of behavior, development, and family leading the history's list, and replacing wax in ears, tonsillar enlargement and flat feet from the physical examination.

In 111 students physical examination failed to reveal health problems

of any great significance not already known from the history. These are interesting findings which deserve further study as not all body systems were examined in all children and the findings on the prior history, while ensuring that the physician would be aware of certain possibilities, may have precluded a more widely ranging examination.

The parental response and involvement at over 90% was unexpected in a population which in common with the total school district population, attended school physical examinations of its children, in the past at a 30% level.

These findings and some of the experience gained in the follow-up of problems detected by the health history, have led to the following opinions regarding the value of the health history in its impact upon the above-listed objectives of school health services:

(a) Health assessment, the first step in assuring optimal health, is greatly expanded by the increased number and broader range of problems discovered by the health history.

The method of history-taking from the parent, plus parental involvement in problem listing and development of management plans, means that there is agreement regarding the "problems" and their follow-up and the parent is not, as in the old system, the recipient of a note from the school requesting action on a "defect" which is insignificant or already under care.

The "treatment" of many problems begins in the nurse-parent interview as the nurse provides education, counseling and anticipatory guidance regarding many problems or matters in development and behavior which worry the parent.

(b) The health history, as noted above, modifies the teacher's and thus the school's response to the child's behavior by providing means to understand that behavior and deal with its causes. The social and mental health environment of the class room and school are thus changed and certain behavioral problems prevented.

(c) The health history calls upon the school nurse to carry out health education, counseling and anticipatory guidance during the conduct of the interview with the parent, in the development of the problem list and plan of management and in follow-up activities with the school and the family. Parents and teachers are assisted to understand and deal with the current and future health problems of children - the young child learns indirectly by example while the older child is directly involved.

One of the underlying rationales for much of current school health practice is that the school detects and the family doctor provides treatment. Unfortunately, family doctors are scarce and those who can knowledgeably handle the health and education problems of young children and adolescents are rare. The problems of dealing with the health care delivery system, and the many barriers which must be overcome, need the expert guidance of a health professional skilled in knowledge of community resources. The same type of follow-up skills used by the first school nurses in the tenements of New York need to be called into play. Successful follow-up depends upon the relationship developed between the parent and nurse. Formerly nurses had to go to the home; today in a different society and with different needs parents have more than demonstrated their willingness to come to the school to begin the school health care of their children.

(d) The development of a close partnership between parents and school nurses bodes well for the general public relations of the school and the development of better relationships between school health and the community's health resources.

The success of the health history could stimulate the community to develop new means by which the captive nature of the school's population could be used to improve the general level of community health.

A school health service using the health history is able to make referrals to community health agencies which are based on adequate information for professional judgement. The referral becomes specific and accompanied by clinical data and parental involvement and agreement, such a situation could help to overcome the poor clinical image school health services have created in the past.

Finally, the use of the health history restores the school physician and the school nurse to fully professional roles: the physician moving to the position of pediatric consultant to the nurse and the nurse acting as case manager in the discovery and solving of the health problems of school children. Such roles with para-professional assistance are consistent with more efficient use of staff.

The doldrums into which school health services fell after its eager and valued beginnings contains many facets of interest. It is extraordinary that the medical profession with all its prestige and power on the one hand, and a needed technique, the health history on the other, was able to exert so little influence. Was it lack of interest in school health or was it that lip-service only has been paid to the health history in an era of burgeoning laboratory techniques?

The price has been spelled out in another context: "When elites fail to keep pace with a world in continual flux - because of traditionalism, social distance, and social self-deception - their mastery over men and events is bound to wane."[21]

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00922

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